

DETAILED ACTION
EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Attorney Robert Chee on 10/29/2009.

In the specification: Please replace paragraph [0031] with amended paragraph [0031] as following:

[0031] Common forms of computer-readable storage medium include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic storage medium, a CD-ROM, any other optical storage medium, a RAM, a PROM, and EPROM, a FLASH-EPROM, any other memory chip or cartridge, as described hereinafter. Common forms of transmission media includes, for example a carrier wave.

In claims:

Please replace claims with all prior versions, and listings, of claims in the application:

1. (Previously Presented) A method of operation within a data processing system, the method comprising:
before receiving a request to execute a statement that requires computation of a first function, associating the first function with a second function that returns a data type descriptor for the first function;
receiving a request to execute the statement that requires computation of the first function to return data from a source; and
in response to receiving the request to execute the statement, performing the steps of:
executing the second function to obtain the data type descriptor that identifies one or more data types of result data that should be returned for the first function;
registering the one or more data types with a data processing system;
compiling the statement based on the registered one or more data types;
executing the first function to obtain the result data;
storing the result data obtained from the source in a format that reflects the registered one or more data types; and
returning the result data as data in the format of the registered one or more data types,
wherein the method is performed by one or more computing devices.
- 2-3. (Canceled)
4. (Previously Presented) The method of claim 1 further comprising determining that the source is associated with the request by determining whether a certain keyword is specified as a data return type for the first function.
5. (Previously Presented) The method of claim 1 further comprising determining that the source is associated with the request by determining whether the first function returns data in an array of data elements.

6-8. (Canceled)

9. (Previously Presented) The method of claim 1 wherein the data type descriptor indicates an arrangement of rows and columns of a database table and wherein storing the result data obtained from the source in a format that reflects the registered one or more data types comprises tabulating the result data according to the arrangement of rows and columns.

10-15. (Canceled)

16. (Currently Amended) A system comprising:

a processor;

a processing entity; and

a memory coupled to the processing entity and having program code stored therein which, when executed by the processing entity, causes the processing entity to:

before receiving a request to execute a statement that requires computation of a first function, associate the first function with a second function that returns a data type descriptor for the first function;

receive a request to execute the statement that requires computation of the first function included in the program code to return data from a source; and
in response to receiving the request to execute the statement, performing the steps of:

executing the second function to obtain the data type descriptor that identifies one or more data types of result data that should be returned for the first function;

registering the one or more data types with a data processing system;

compiling the statement based on the registered one or more data types;

executing the first function to [[the]] obtain the result data,

storing the result data obtained from the source in a format that reflects the registered one or more data types; and
returning the result data as data in the format of the registered one or more data types.

17-21. (Canceled)

22. (Previously Presented) A volatile or non-volatile computer-readable storage medium carrying one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to:
before receiving a request to execute a statement that requires computation of a first function, associate the first function with a second function that returns a data type descriptor for the first function;
receive a request to execute the statement that requires computation of the first function to return data from a source; and
in response to receiving the request to execute the statement, performing the steps of:
executing the second function to obtain the data type descriptor that identifies one or more data types of result data that should be returned for the first function;
registering the one or more data types with a data processing system;
compiling the statement based on the registered one or more data types;
executing the first function to obtain the result data,
storing the result data obtained from the source in a format that reflects the registered one or more data types; and
returning the result data as data in the format of the registered one or more data types.

23-24. (Canceled)

25. (Previously Presented) The method of claim 1 wherein the registered one or more data types is used to type-check the first function.
26. (Previously Presented) The volatile or non-volatile computer readable storage medium of claim 22 further comprising determining that the source is associated with the request by determining whether a certain keyword is specified as a data return type for the first function.
27. (Previously Presented) The volatile or non-volatile computer readable storage medium of claim 22 further comprising determining that the source is associated with the request by determining whether the first function returns data in an array of data elements.
28. (Previously Presented) The volatile or non-volatile computer readable storage medium of claim 22 wherein the data type descriptor indicates an arrangement of rows and columns of a database table and wherein storing the result data obtained from the source in a format that reflects the registered one or more data types comprises tabulating the result data according to the arrangement of rows and columns.
29. (Canceled)
30. (Previously Presented) The volatile or non-volatile computer readable storage medium of claim 22 wherein the registered one or more data types is used to type-check the first function.
- 31-34. (Canceled)

35. (Previously Presented) The system of claim 16 further comprising determining that the source is associated with the request by determining whether a certain keyword is specified as a data return type for the first function.
36. (Previously Presented) The system of claim 16 further comprising determining that the source is associated with the request by determining whether the first function returns data in an array of data elements.
37. (Previously Presented) The system of claim 16 wherein the data type descriptor indicates an arrangement of rows and columns of a database table and wherein storing the result data obtained from the source in a format that reflects the registered one or more data types comprises tabulating the result data according to the arrangement of rows and columns.
38. (Previously Presented) The system of claim 16 wherein the registered one or more data types is used to type-check the first function.
39. (Previously Presented) The method of Claim 1 wherein the one or more registered data types are temporary and are deleted (a) when execution of the statement is complete or (b) when a compilation of the statement is deleted, overwritten, or otherwise removed from memory.
40. (Previously Presented) The method of Claim 1 wherein the one or more registered data types includes a flag to indicate that the one or more registered data types are temporary;
executing a process periodically to identify temporary data types; and
deleting the temporary data types identified for which (a) execution of all statements referencing the one or more data types is complete or (b)

where compilations of all statements referencing the one or more data types have been removed from memory.

41. (Previously Presented) The volatile or non-volatile computer readable storage medium of Claim 22 wherein the one or more registered data types are temporary and are deleted (a) when execution of the statement is complete or (b) when a compilation of the statement is deleted, overwritten, or otherwise removed from memory.
42. (Previously Presented) The volatile or non-volatile computer readable storage medium of Claim 22 wherein the one or more registered data types includes a flag to indicate that the one or more registered data types are temporary; executing a process periodically to identify temporary data types; and deleting the temporary data types identified for which (a) execution of all statements referencing the one or more data types is complete or (b) where compilations of all statements referencing the one or more data types have been removed from memory.
43. (Previously Presented) The system of Claim 16 wherein the one or more registered data types are temporary and are deleted (a) when execution of the statement is complete or (b) when a compilation of the statement is deleted, overwritten, or otherwise removed from memory.
44. (Previously Presented) The system of Claim 16 wherein the one or more registered data types includes a flag to indicate that the one or more registered data types are temporary; executing a process periodically to identify temporary data types; and deleting the temporary data types identified for which (a) execution of all statements referencing the one or more data types is complete or (b)

where compilations of all statements referencing the one or more data types have been removed from memory.

Allowable Subject Matter

2. Claims 1, 4-5, 9, 16, 22, 25-28, 30, 35-44 are allowed.

The prior art of record alone or in combination, does not teach or fairly suggest the combination of steps as recited in independent claims 1, 16 and 22, wherein "executing the second function to obtain the data type descriptor that identifies one or more data types of result data that should be returned for the first function, associating the first function with a second function that returns a data type descriptor for the first function; registering the one or more data types with a data processing system; compiling the statement based on the registered one or more data types; executing the first function to obtain the result data; storing the result data obtained from the source in a format that reflects the registered one or more data types; and returning the result data as data in the format of the registered one or more data types".

Contact Information

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cam Y T. Truong whose telephone number is (571) 272-4042. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tony Mahmoudi can be reached on (571) 272-4078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cam Y Truong/
Primary Examiner, Art Unit 2169